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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/676,704

09/30/2003

Jay B. Chase

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8130

7590

09/09/2005

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EXAMINER

RADI, JOHN A

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/676,704	<b>Applicant(s)</b> CHASE ET AL.	
	<b>Examiner</b> John A. Radi	<b>Art Unit</b> 3641	

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/30/03</u> . | 6) <input type="checkbox"/> Other: _____  |

*[Handwritten signature]*

## **DETAILED ACTION**

### ***Specification***

The use of the trademark KAPTON™ and PARYLENE™ have been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "said shaped charge." There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "said chip slapper." There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "said chip slapper." There is insufficient antecedent basis for this limitation in the claim.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. Claim 13 appears to contain a typographical error in which two complete claims were combined, one dependent on claim 1, and the other dependent on claim 12. It is unclear what the claimed invention contains.

Claims 15-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15-19 are method claims incorrectly made dependent on claims which are drawn to a structure or apparatus.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brooks et al. (US 6386108), and further in view of Wu et al. (US 6227114).

Brooks discloses a plurality of capacitor discharge units, CDUs (fig. 2A, 21), wherein each of said units further comprises: a capacitor (fig. 3, 18), an electrical bridge

Brooks discloses a plurality of capacitor discharge units, CDUs (fig. 2A, 21), wherein each of said units further comprises: a capacitor (fig. 3, 18), an electrical bridge type detonator (22), associated circuitry to charge said units (fig. 3), and a trigger mechanism (62) to simultaneously (62) initiate each said detonator ("to within 100 ns," col. 8, line 44). In an alternate embodiment, Brooks also discloses a chip slapper (col. 3, line 42, and col. 5, line 17) operatively coupled to a shaped charge (figure 2A and 4A). Brooks also teaches a bridge type detonator wherein the bridge is aluminum (col. 6, line 54 and fig. 4A).

Brooks does not disclose an optical receiver in said discharge unit, or corresponding optical fibers to provide an optical trigger to said optical receiver. Furthermore, Brooks does not explicitly disclose an electrical bridge capable of initiating with less than 50 mj of energy, or an initiating switch selected from the group of: a Power Fet, a solid dielectric breakdown switch, a MOS-Controlled Thyristor or an Insulated Gate Bipolar Transistor.

With respect to the initiation of the electrical bridge limitation, Brooks doesn't explicitly teach an initiation less than 50 mj of energy, however Brooks does teach that it is an inherent design choice to increase the efficiency of the bridge circuitry to minimize the activation energy and time, thereby creating a near simultaneous explosion of the multiple discharge units (col. 4, lines 36-63). It would therefore be obvious to one skilled in the art of oil field management to select commercially available CDUs to minimize the activation energy and activation time.

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With regard to the optical trigger mechanism, Wu et al. teaches a plurality of CDUs, wherein each of said CDUs further comprises an optical receivers which is operatively connected to a triggering unit by one or more optical fibers adapted to provide an optical trigger signal, wherein said signal is used to simultaneously initiate a series of detonators located within each CDU.

With regard to the selection of the initiating switch, columns 7-11 of Brooks are devoted to the disclosure of 11 different types of switching mechanisms all of which can be said to be obvious variants of the Power Fet, MOS-Controlled switching circuits claimed by the applicant. In fact, the use of IGBTs, MOSFETs, and similar type switching mechanisms are well-known in the art of detonators and blasting mechanisms (see Liu, US 6470803, paragraph 14). Therefore, it would be *prima facie* obvious to use an initiating switch selected from the Markush Group as claimed in claims 6, 13, and 19.

The motivation for combining the optical trigger mechanism of Wu with Brooks can be found in Wu, in which it is stated in the description of prior art:

Trigger or detonation systems, including systems using optical fiber for detonating explosive charges in an oil well, are known in the art. For example, U.S. Pat. No. 4,391,195 shows and describes a detonation system of explosives charges having a laser source, a distributor, a control unit, optical fibers, branching connections and explosive charges.

Furthermore, Wu teaches it's optical trigger mechanism can be used in oil well perforation operations where safety is paramount (Col. 7, Line 5):

In oil well perforation and other operations, safety is paramount. To ensure safety, multiple trigger signals have to be positive to detonate an

explosive. The present invention can be used to provide a trigger signal rather than to actually detonate the explosive. For example, a photodetector can be attached to the fiber as part of a light triggered detonation system. The electric energy stored in the photodetector is not used to directly detonate the explosive but to generate a voltage as one of the signals needed to trigger a detonator. Not very much energy is needed for this application.

Therefore, it would have been obvious to one skilled in the art at the time of invention, to combine the optical trigger mechanism of Wu with the multiple explosive initiating device of Brooks.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. Radi whose telephone number is 571-272-5883. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J. Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MICHAEL J. CARONE  
SUPERVISORY PATENT EXAMINER